

Watershed Emergency Response Team (WERT) and Post-Fire Watershed Restoration/Recovery

SWRR Meeting - May 3rd, 2018

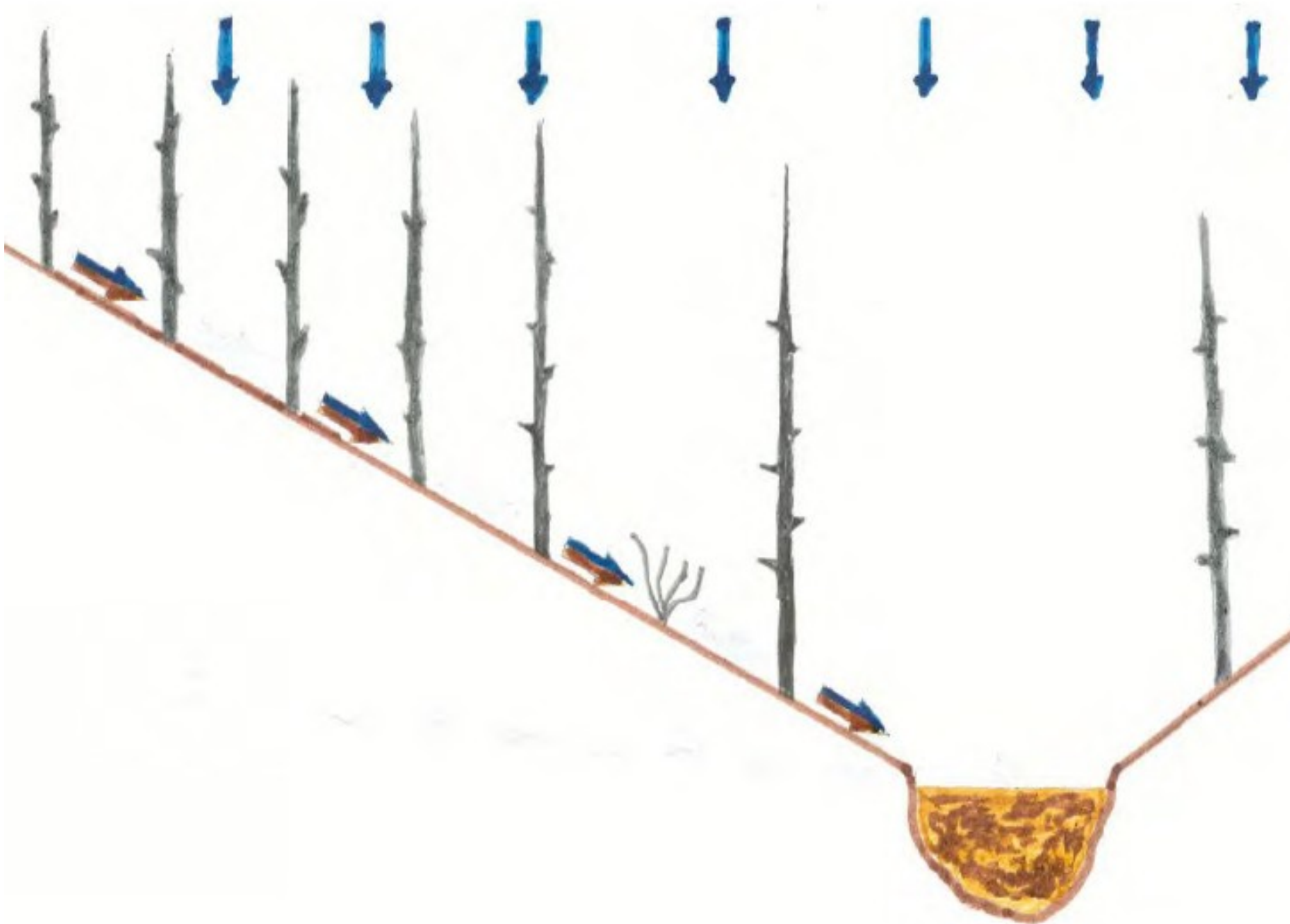


Pre-Fire



(used with permission from Dr. Lee Macdonald – Colorado State University)

Post-Fire



(used with permission from Dr. Lee Macdonald – Colorado State University)



WERT Primary Goals



Assessing soil burn severity

- Assist Communities
- A rapid evaluation of values-at-risk (**VARs**) subject to post-fire hazards, including:
 - Debris Flows
 - Flooding
 - Rock fall
- Life-safety-property focus

WERT Process

- Develop soil burn severity map
- Spatially explicit modeling and evaluation of post-fire debris flow potential, erosion rates, and peak flow
- Identification of values-at-risk (VARs) on non-federal land
- Hazard determination for VARs
- Preliminary/general recommendations to mitigate hazard(s)
- Communication to affected and/or responsible parties

Field Evaluation

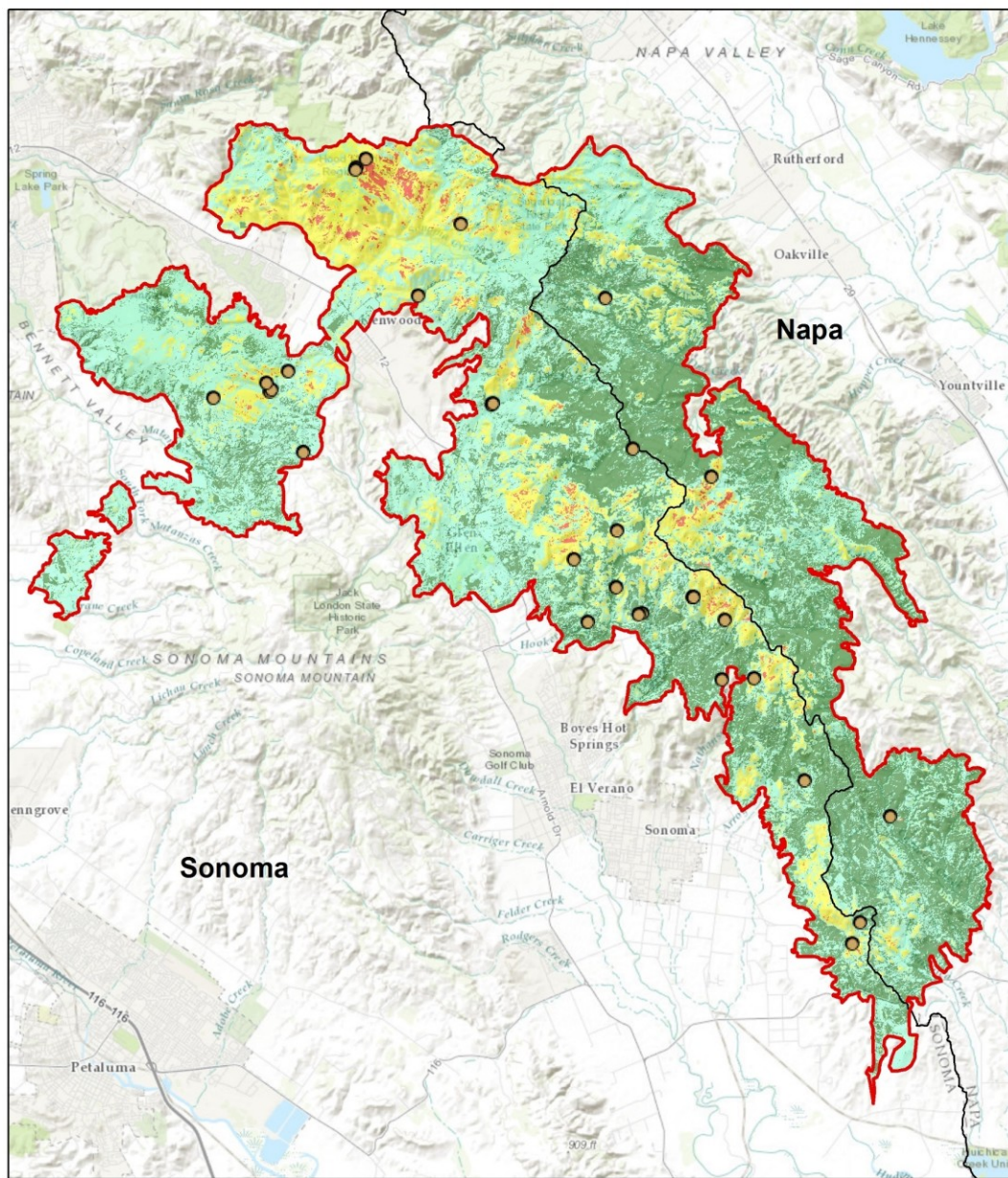


Assessing debris flow and flooding hazards along
Castle Rock Road – Nuns Fire

- Performed by licensed professionals
 - Engineering geologists, civil engineers, hydrologists
- Relative hazard to life and property determined by a combination of:
 - Professional judgement based on geomorphic evidence
 - Modeling
 - Spatial data (e.g., proximity to mapped flood inundation zones)

Soil Burn Severity Mapping

- Soil burn severity map gives WERT a spatially-distributed view of post-fire soil alteration
 - Drives hazard evaluation and modeling
- Generated from satellite imagery and validated through field assessment



Burn Severity

- Very Low/ Unburned 34.9%
- Low 45.7%
- Moderate 17.9%
- High 1.5%

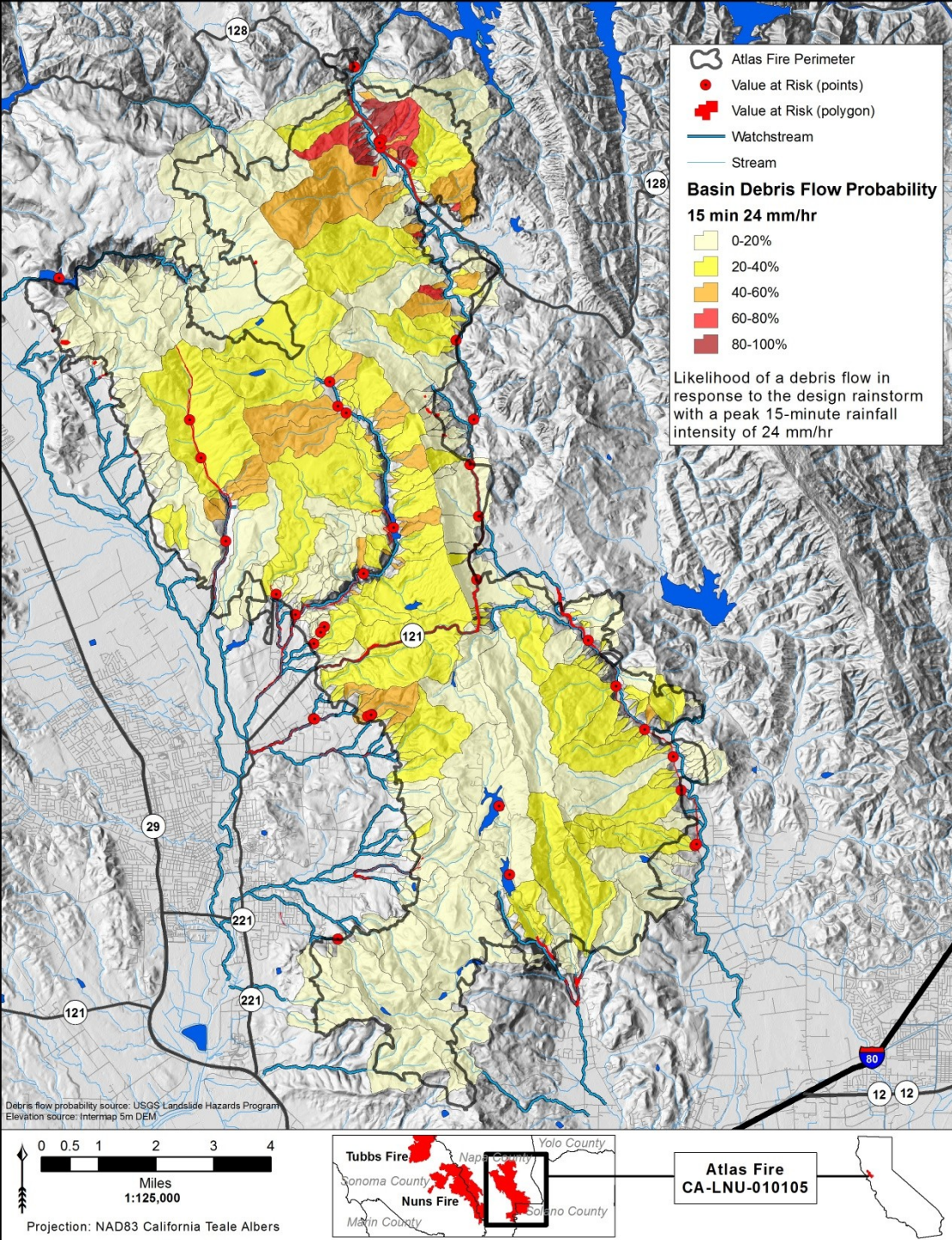
- BARC Field Verification - Points
- BARC Field Verification - Polygons
- Nuns Fire Perimeter (Per GTAC as of 10/19/17)
- California County Boundaries

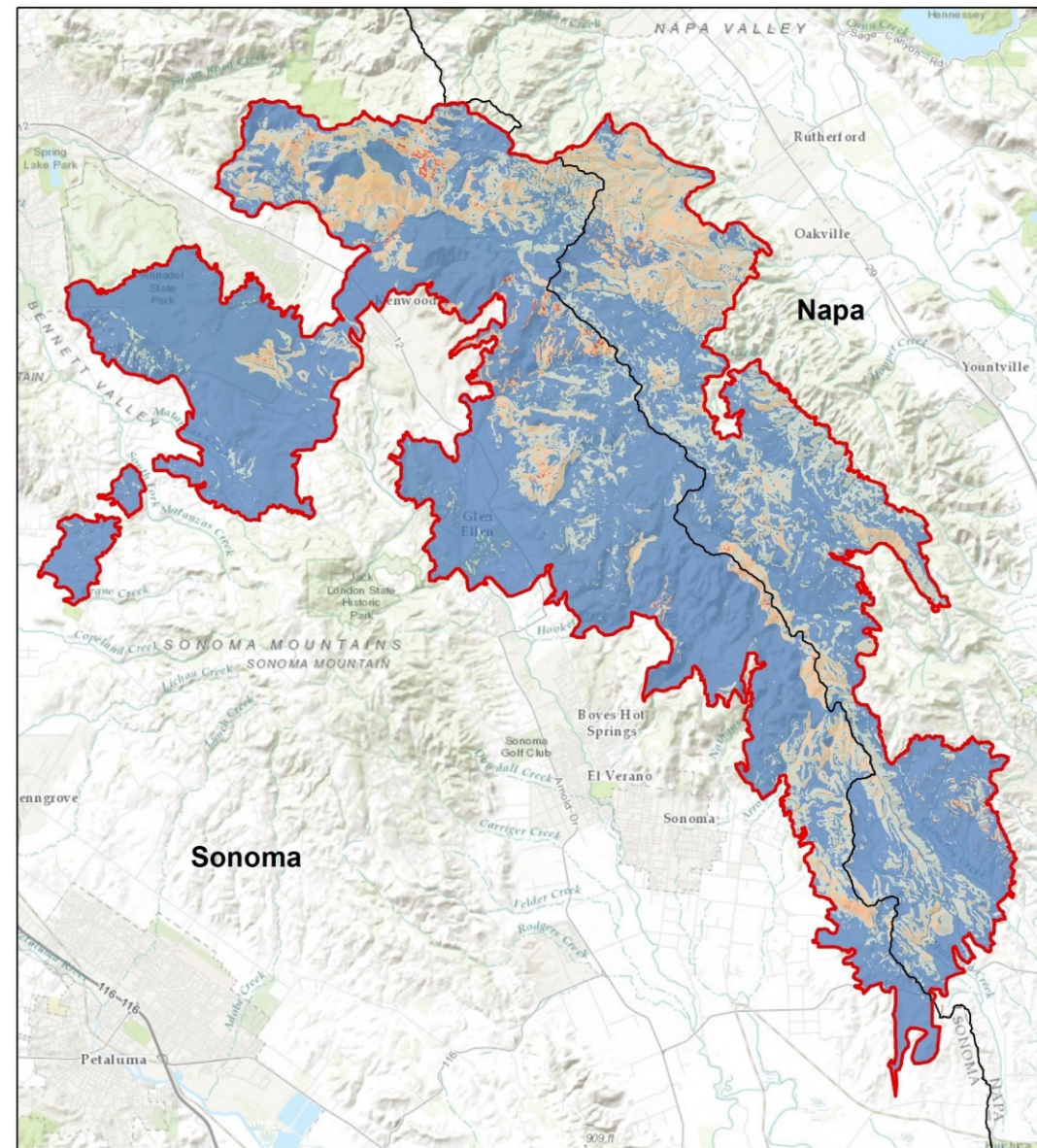
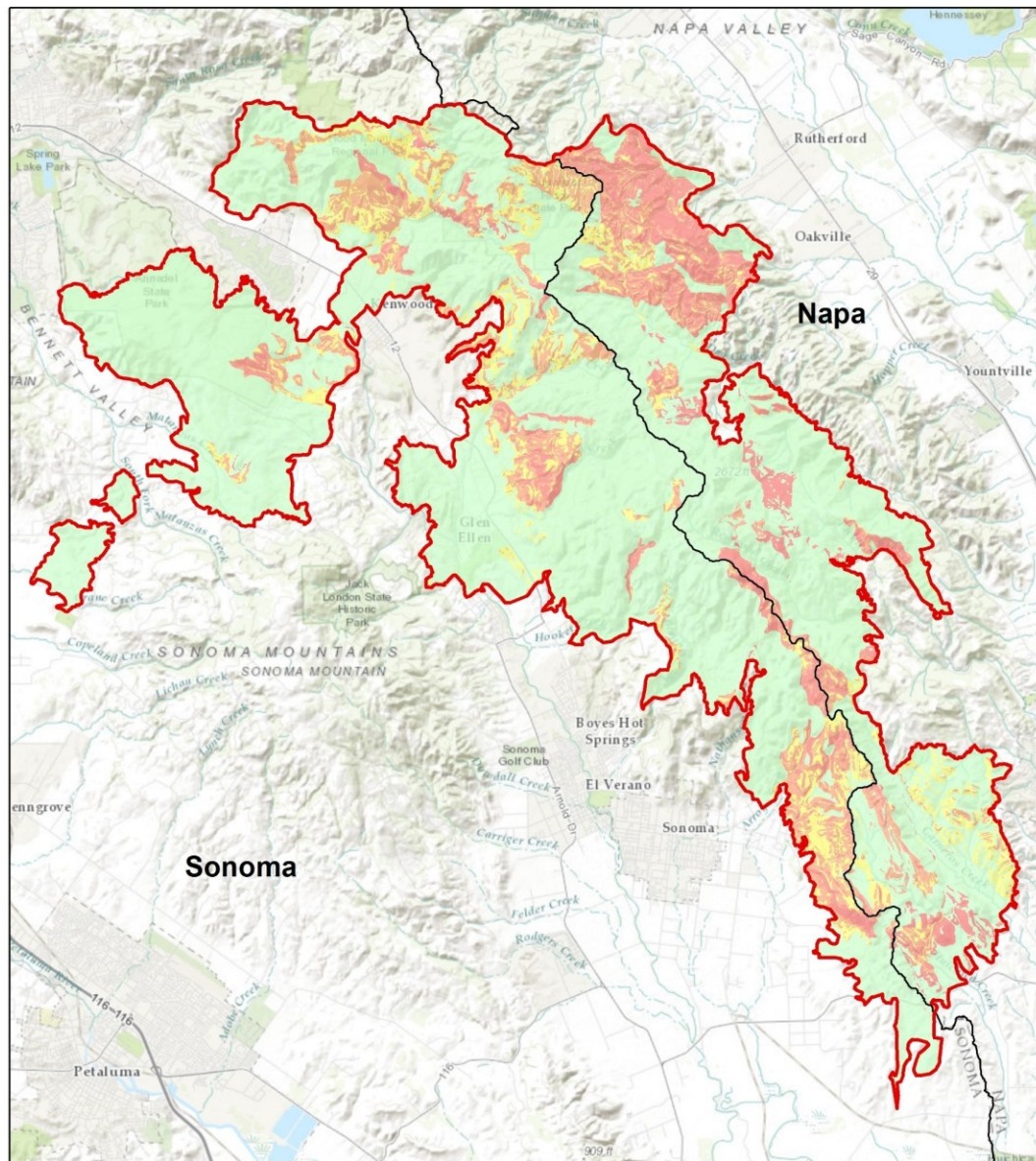
**Burn Severity Map With
Field Site Locations**

0 1 2 4 Miles

Spatially-Explicit Modeling

- USGS Post-Fire Debris Flow model
 - Basin and segment probability
 - Volumetric debris yield
- Unvalidated for North Bay fire area





ERMiT—web-based tool to predict surface erosion from pre- and post-fire hillslopes

Pre-fire:
0.25 t/ac

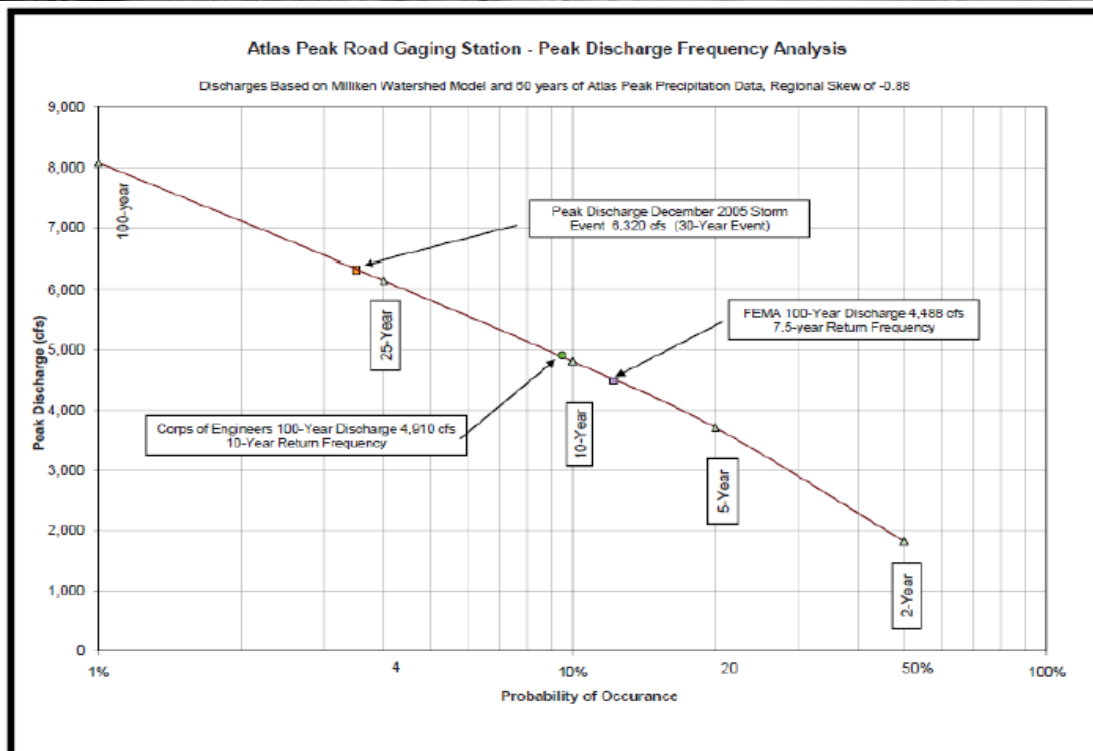
Post-fire:
12.1 t/ac

50%
probability of
2-yr event



Post-Fire Runoff Prediction

Pour Point ID	Description	Flow Increase from Pre-Fire Conditions*	Post-Fire Adjusted Return Interval*
HWY	HWY 128 small drainage	90%	~150
WHT	White Ck above Wooden Valley Rd	37%	30
MIL3	Milliken Reservoir	32%	25
MIL2	Milliken Ck West Fk at Atlas Peak Rd	30%	25
HAG	Hagan Ck below 3 rd Ave	27%	20 - 25
MIL1	Milliken Ck at Westgate Dr	27%	20 - 25
SOD	Soda Ck above Silverado Trail	27%	20 - 25
WVC	Wooden Valley Ck above Wooden Valley Rd	23%	20
SAR	Sarco Ck at Vichy Ave	21%	15 - 20
GRE	Green Valley Ck at Twin Cks Dr	20%	15 - 20
CAP	Capell Ck above Middle Ck	17%	15 - 20
TUL	Tulucay / Murphy Ck at 4 th Ave	15%	15
REC	Rector Reservoir	5%	10 - 12



WERT is a Facilitator of Science/Research



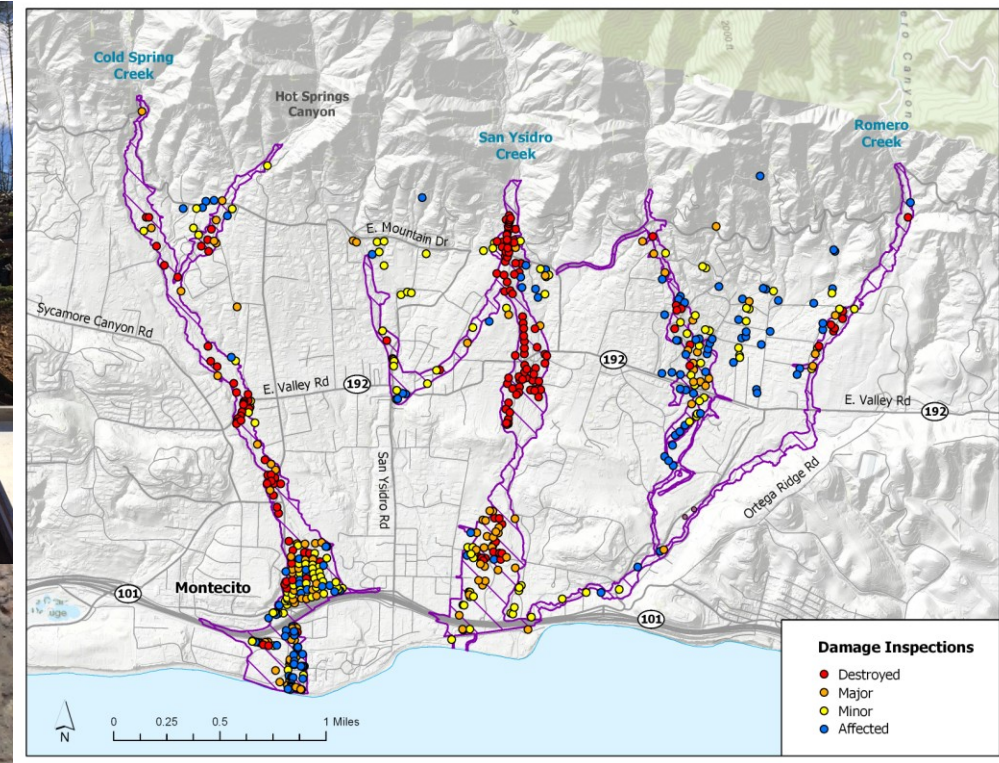
Boggs Mountain
Demonstration State
Forest (BMDSF)
– Catchment Scale
Runoff and Sediment
Delivery



Rainfall
Simulation-
BMDSF



John Moody (USGS), Thomas Fire – Post-fire K_{sat} and sorptivity



Inundation Mapping and Damage
Assessment, Thomas Fire

Valley Fire – Boggs Mountain Demonstration State Forest

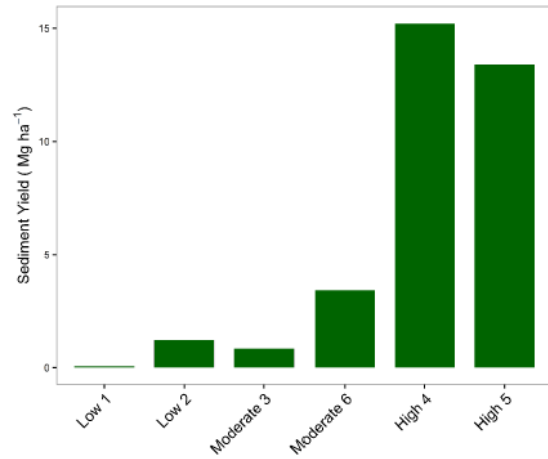
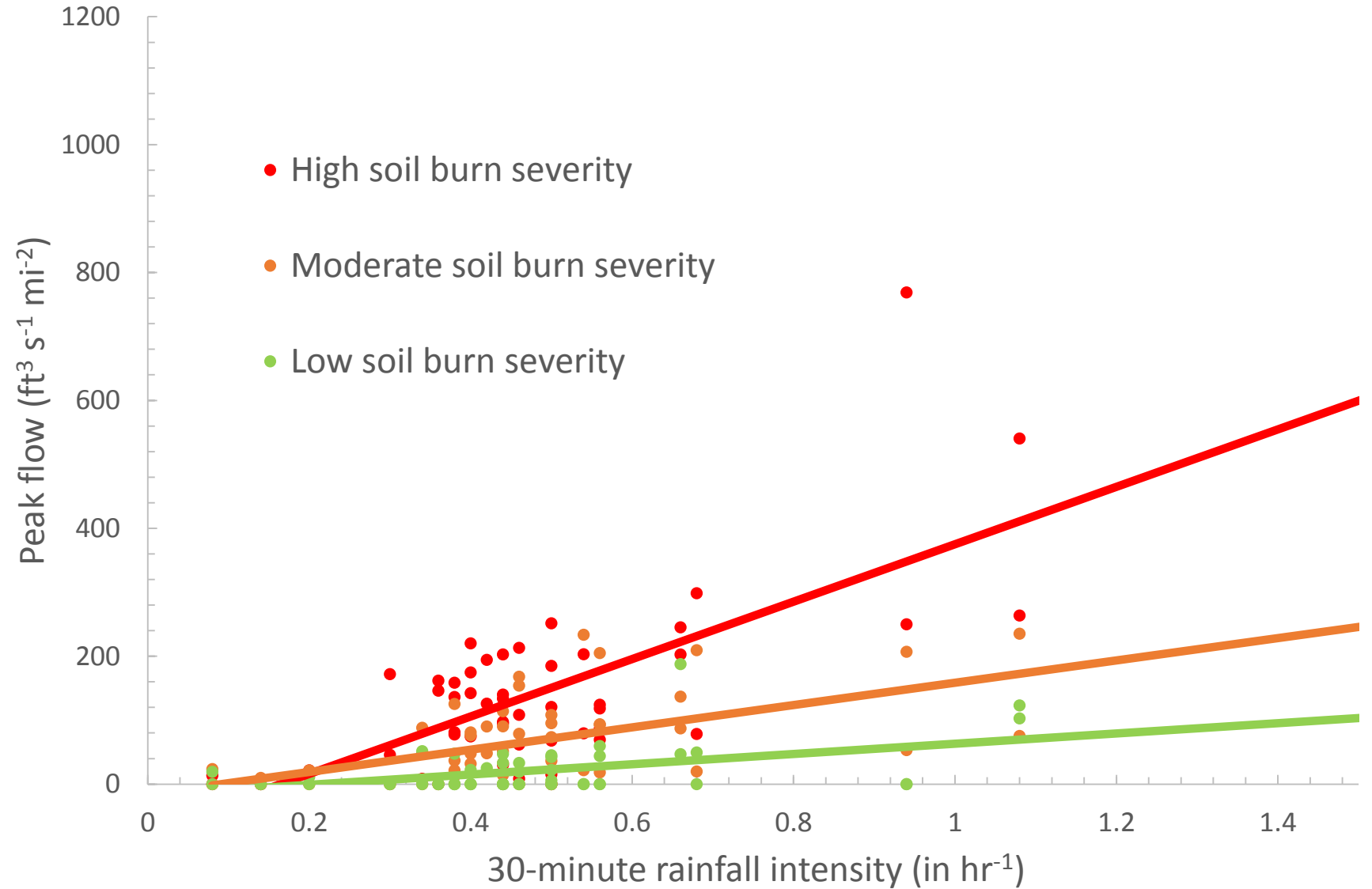


Figure 2.8: Sediment yields by swale and burn severity at BMDSF from October 2015 to June 2016. No additional sediment was produced through September 2016.





Using
WERT
Products
to
Identify
Post-Fire
Restoration
Opportunities

Atlas
Fire



WERT Products Can:

- Provide spatially-explicit view of post-fire processes and hazards
- Can allow local entities/stakeholders to focus efforts on values-at-risk most affected by post-fire watershed conditions



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